

**CLAIMS**

1. A circulating fluidized bed reactor comprising a reaction chamber (1) connected by an acceleration duct (4) to a centrifugal separator (2) for separating particles from hot gases coming from said reaction chamber (1), characterized in that at least part of the acceleration duct (4) is inside the top of the reaction chamber (1) and the centrifugal separator (2) has substantially straight vertical walls.

2. A fluidized bed reactor according to claim 1, characterized in that all of the acceleration duct (4) is inside the top of the reaction chamber (1).

3. A fluidized bed reactor according to claim 1 or claim 2, characterized in that the acceleration duct (4) has an inlet mouth substantially perpendicular to the extrados of the duct (4).

4. A fluidized bed reactor according to claim 1 or claim 2, characterized in that the acceleration duct (4) has an inlet mouth substantially parallel to the extrados of the duct (4).

5. A fluidized bed reactor according to any preceding claim, characterized in that the centrifugal separator (2) and the reaction chamber (1) have a common wall.

6. A fluidized bed reactor according to any preceding claim, characterized in that the centrifugal separator (2) and the rear cage (3) have a common wall.

7. A fluidized bed reactor according to claim 5, characterized in that the reaction chamber (1) and the rear cage (3) have a common wall (1b).

8. A fluidized bed reactor according to any preceding claim, characterized in that the combination of the reaction chamber (1), the separator (2) and the rear cage (3) constitutes a basic module.

9. A fluidized bed reactor according to claim 8, characterized in that the reaction chamber (1) and the separator (2) have aligned exterior walls.

5 10. A fluidized bed reactor according to claim 8 or claim 9, characterized in that the power of the reactor is a function of the number of basic modules used.

10 11. A fluidized bed reactor according to any of claims 8 to 10, characterized in that two adjacent modules have a common wall.

12. A fluidized bed reactor according to claim 11, characterized in that the wall common to two modules and between two separators (2) is a partial wall.

15 13. A fluidized bed reactor according to any of claims 8 to 12, characterized in that the reaction chambers (1) of two adjacent modules are combined.

14. A fluidized bed reactor according to any of claims 8 to 13, characterized in that the rear cages (3) of two adjacent modules are combined.

20 15. A fluidized bed reactor according to any preceding claim, characterized in that the interior wall of the reaction chamber (1) includes an inlet deflector (11) of the acceleration duct (4).

25 16. A fluidized bed reactor according to any of claims 1 to 15, characterized in that the walls are tubed.

30 17. A fluidized bed reactor according to claim 16, characterized in that the walls of the acceleration duct (4) and the separator (2) and the bottom wall and the top wall of the reaction chamber (1) are covered with a layer of refractory material.

35 18. A fluidized bed reactor according to claim 16, characterized in that the walls (40, 41, 42, 43, 44) of the portion of the acceleration duct (4) inside the reaction chamber use tubes (8) from the walls of the

reaction chamber (80).

19. A fluidized bed reactor according to claim 16, characterized in that the walls (40, 41, 42, 43, 44) of the portion of the acceleration duct (4) inside the reaction chamber use tubes (8) from the walls of the separator (2).

20. A fluidized bed reactor according to any preceding claim, characterized in that the walls (40, 41, 42, 43, 44) of the acceleration duct (4) consist of tubes (8) forming a separate circuit.

21. A fluidized bed reactor according to claim 16 or claim 18, characterized in that the walls (44a) of the portion of the acceleration duct (4) between the reaction chamber (1) and the separator (2) consist of tubes (80) from the walls of the reaction chamber and the separator.

22. A fluidized bed reactor according to claim 15, characterized in that the deflector (11, 45) consists of tubes (8) diverted from the walls of the reaction chamber (1).

23. A fluidized bed reactor according to any preceding claim, characterized in that a deflector is formed by rounding the tubes (8) of the floor of the duct (4).

24. A fluidized bed reactor according to any preceding claim, characterized in that the floor (40, 42, 43) of the duct (4) is inclined toward the separator (2).

25. A fluidized bed reactor according to any preceding claim, characterized in that the floor (40, 42, 43) of the duct (4) is inclined toward the extrados of the duct (4).

26. A fluidized bed reactor according to any preceding claim, characterized in that the section of the exterior and interior walls (41) of the duct (4) changes more than once.

27. A fluidized bed reactor according to any

preceding claim characterized in that the gases are evacuated from the centrifugal separator (2) via a vertical duct (23) situated inside said separator (2) and which directs the gases toward the bottom of the separator (2).

28. A fluidized bed reactor according to claim 27 characterized in that the duct (23) is placed in the middle of the separator (2).

29. A fluidized bed reactor according to claim 27 characterized in that a deflector is placed at the top of the separator (2).

30. A fluidized bed reactor according to claim 28 characterized in that the deflector has a section at least equal to that of the flue gas evacuation duct (23), its position is substantially aligned with that of the evacuation duct (23), and its height is less than that of the constant section portion of the separator (2).

31. A fluidized bed reactor according to any preceding claim characterized in that the separator (2) is carried by at least one of the evacuation ducts (5, 23) of the separator (2).

32. A fluidized bed reactor according to any preceding claim characterized in that the rear cage (3) is horizontal.

33. A fluidized bed reactor according to any preceding claim characterized in that the rear cage (3) is situated under the separator (2).

34. A fluidized bed reactor according to any preceding claim characterized in that the rear cage (3) is placed on concrete slabs (9).

35. A fluidized bed reactor according to any preceding claim characterized in that a secondary separator is placed between the main separator (2) and the rear cage (3).